TECHNICAL NOTES

U.S. DEPARTMENT OF AGRICULTURE WYOMING SOIL CONSERVATION SERVICE

Biology No. 308 January 1986

Subject: LONGNOSE SUCKER*

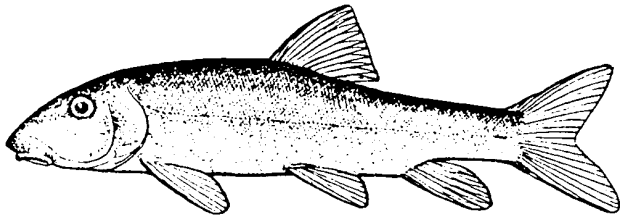
General

The longnose sucker (Catostomus catostomus) is the most widespread sucker in the North and is found in large numbers in most clear, cold waters. The species occurs throughout Canada and Alaska and south to western Maryland, north to Minnesota, west and north through northern Colorado and through Washington in the U.S.A. It occurs in arctic drainages of eastern Siberia and North America, but is not found in the arctic islands or in insular Newfoundland. Sporadic populations occur farther south where it appears as a glacial relict or semirelict population; but, in general, longnose suckers probably do not occur south of 400 north latitude, except in West Virginia.

The longnose sucker has been reported to hybridize with the mountain sucker, C. platyrhynchus end with the white sucker, C. commersoni. Dwarf forms of the longnose sucker, which ere often late-spawning, have been considered separate subspecies (C. c. nannomyzon in the East and C. c. pocatello in Idaho and Montana)

Age, Growth, and Food

In the northern part of its range, the longnose sucker reaches maturity at ages IV to VII, usually IV to V for males and V to VI for females. In Colorado, maturity occurs at age III for males and age IV for females.



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*Information taken from Ecoregion M3113 Handbook and Habitat Suitability Index Models, Wildlife Species Narratives (literature searches), U.S. Fish and Wildlife Service, various dates between 1978-1984.

The largest longnose sucker on record was a 19-year-old female that was 642 mm long and weighed 3.3 kg from Great Slave Lake. Longnose suckers rarely attain a length greater than 450 mm and a weight greater than 1 kg and usually do not live more than 8 to 11 years. Individuals in the North are significantly smaller than those in the south. Females are larger than males and tend to live longer.

Longnose sucker fry feed on zooplankton and diatoms, making a transition to larger organisms, such as benthic invertebrates, as they grow. Adults are generally omnivorous, consuming amphipods, benthic insects, and other invertebrates, depending on food availability. They also ingest plants, algae, and detritus, but have not been known to take vertebrates. One study found that the species would primarily eat vegetation and insects in tributaries and crustaceans and dipterans in lakes. Longnose suckers tend to be more "pelagic" feeders than other suckers.

Food supply is an important limit to growth for longnose suckers. In the southern part of the Great Slave Lake, Canada, which has been enriched with organic material, longnose sucker growth rate was greater than, in the northern part of the lake, which is more oligotrophic. One study found that growth of longnose suckers was lowest in the rapid waters below a waterfall and fastest in the slow moving waters downstream. In both cases, *a* greater supply of food is believed to have increased the growth rate.

Reproductive Requirements

Spawning usually occurs in tributary streams of larger bodies of water, but spawning will also take place in shallow areas of large lakes or reservoirs. Spawning migrations begin from mid-April to early July as ice breaks up in the spring, but the spawning peak is usually in June.

Spawning movements being at 5° to 9°C. Spawning itself occurs at about 10° to 15°C with all fish usually spent at 15°C. One study found that initial upstream movement is related to water temperature, while the rate of movement is influenced by fluctuations in discharge. Another study found that both water temperature and discharge play a role in the initiation of spawning migration, depending on which condition is limiting in the spring.

The longnose sucker does not prepare a nest. The adhesive eggs are broadcast over clean gravel and rocks (1 to 20 cm) in riffle areas where there is a velocity about 0.3 to 1.0 m/sec or along wave-swept shorelines at depths about 15 to 30 cm.

Specific Habitat Requirements

Longnose suckers in North America inhabit streams, lakes, and reservoirs. Longnose suckers from lake environments will enter rivers only to spawn or overwinter.

The species is most abundant in cold, oligotrophic lakes, 34 to 40 m deep. These lakes are characterized as having very little littoral area, with the depth increasing rapidly. Total dissolved solids (TDS)

levels of these lakes are generally <10 to 20 mg/l, and Secchi disk readings range from 4 to 13 m.

Longnose suckers are less successful than other suckers, such as white suckers, in reservoirs with fluctuating water levels. They can do well initially in new impoundments of swift rivers due to increased production of benthos. Because they are well adapted to high current velocities, longnose suckers will also live in swift rivers with a stony bottom, moving into areas with strong currents to spawn.

Abundant populations of suckers were found in two Canadian lakes with pH ranges of 6.7 to 7.3 and 7.8 to 8.2. It is assumed that a pH within the range of 6.6 to 8.2 would be adequate for Longnose suckers. Dissolved oxygen (DO) levels were high in these two lakes. In several studies of longnose suckers, the dissolved oxygen concentration levels have varied from 5.6 to 10.0 ppm. (The. committee on Water Quality Criteria (1972) indicates that DO concentrations should not fall below 6 ppm to maintain good freshwater fish populations.)

Longnose sucker habitat usually has very clear and clean water. Effects of turbidity on longnose suckers have not been determined. One researcher observed the species spawning in a river with extreme turbidity, but did not quantify the levels.

The longnose sucker is known to frequent brackish water and can be abundant at times in brackish water around river mouths.

Adult. The preferred temperature range for adults is 10° to 15°C with the greatest numbers collected at 11.6°C. Adults caught at 14.4°C all died at 28.3°C; for those fish acclimated at 11.5°C, the upper lethal temperature (50 percent mortality in 24 hours) was 27°C. In northern Saskatchewan, temperatures in a lake with longnose suckers ranged from 3°C in mid-June to 18.5°C in mid-August. Mean midsummer temperatures in a western Canadian alpine lake with abundant longnose suckers were 6.2° to 10.8°C, but exceeded 16°C in a southern Alberta reservoir also containing longnose suckers.

Longnose sucker adults are most common at depths up to 30 m, but will move inshore at night to feed or to spawn. In Great Slave Lake, longnose suckers were uncommon below 17 m, but were occasionally found at great depths. The species has been found up to 183 m in Lake Superior.

Overwintering areas are necessary primarily in northern areas with prolonged ice cover. These areas must have adequate oxygen as well as be of suitable depth.

Embryo. The eggs settle to the bottom in the gravel near the tail of the riffle where they receive an abundant supply of oxygen, which is necessary for embryo development. Incubation will take 8 days at about 15°C and 11 days at about 10°C. One study observed embryos hatch after 14 days at a mean temperature of 12.2°C.

Fry. Fry (11-18 mm) remain in the gravel for 1 to 2 weeks. After emerging from the gravel, they drift downstream primarily at night. Drifting wag greatest when stream velocity was very fast, but the rate of downstream movement was related to the age of the larvae and not to differences in temperature, discharge, or turbidity. Temperature can, however, influence embryological development. One study reports that fry spend the first summer in the river. Another study reported that peak fry migration was about 1 month after spawning. Fry seek food and shelter in shallow, quiet water with vegetation. Fry congregate in the top 150 mm of water and within 2 m of shore. Fry are assumed to tolerate temperature fluctuations common to shallower water. Reservoir drawdowns in June and July (before fry begin to move to deeper water) may cause fry mortality.

Juvenile. Juvenile longnose suckers (23 to 89 mm) live in lentic waters and frequent shallow, weedy areas. Juveniles remain in subsurface areas and have not been observed feeding on the bottom. Juveniles seek out areas with some current and may enter the lower reaches of streams to Jive, yet they will only move into the upper reaches as adults to spawn.